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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/773,245	02/09/2004	Yasuharu Sasaki	248707US2	7165
22850 7590 01/11/2007 OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER DHINGRA, RAKESH KUMAR	
			ART UNIT 1763	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		01/11/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/773,245	Applicant(s) SASAKI ET AL.	
	Examiner Rakesh K. Dhingra	Art Unit 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 November 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-47 is/are pending in the application.
 4a) Of the above claim(s) 9, 11, 14 and 26-45 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10, 12, 13, 15-25, 46 and 47 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 November 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

The drawings were objected to because of following:

1) Figure 1 – pointer lines for reference number 45 (chuck electrode) and reference number 46 (insulation layer) may please be corrected since these are not correctly pointing in the drawing;

2) Figure 7 – Reference number 92B is repeated both for left and right cassette chambers – the drawing should indicate reference number 92A for the left cassette chamber (page 30, line 13).

Drawings (Figures 1, 7) forwarded with the applicant's response dated 11/3/06 do not show the corrections as were required by the previous office action. For instance, in Figure 1, pointer line for reference number 45 (chuck electrode) still points towards the insulation layer (reference number 46).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Response to Arguments

Applicant's arguments with respect to claims 1-8, 10, 12, 13, and 15-25 have been considered but are moot in view of the new ground(s) of rejection as explained hereunder.

Applicant has amended independent claims 1, 4, 5 by adding new limitations (for example in claim 1 – “and spaced apart from an outer periphery of the to be treated substrate”). Further, applicant has also added new claims 46, 47.

New references Selwyn et al (US Patent No. 5,716,486) and Kholodenko et al (US Patent No. 5,942,039) have been found which when combined read on amended claims 1, 5 limitations. Accordingly claims 1, 5 have been rejected under 35 USC 103 (a) as explained below. Further, remaining claims 2-4,6-8, 10, 12, 13, 15-25 and 46, 47 have also been rejected under 35 USC 103 (a) as explained below.

Further, Claims 1, 5, 10, 12, 13,15-25 have also been rejected for double patenting as explained below.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 4, 5, 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Selwyn et al (US Patent No. 5,716,486) in view of Kholodenko et al (US Patent No. 5,942,039).

Regarding Claims 1, 5: Selwyn et al teach a plasma processing apparatus (Figure 19) for performing a processing on a to-be- treated substrate 22 mounted on a electrode assembly 20 (mounting table) in a chamber (processing vessel) by plasma of a processing gas comprising:

a focus ring 125 installed to surround the to-be- treated substrate 22 on the electrode assembly 20 and spaced apart from an outer periphery of the substrate 22;

a buried element (one or more electrodes) embedded in the focus ring member 125; and,

a DC power supply 39 for applying a DC voltage to the one or more buried elements (electrode) [column 8, line 66 to column 9, line 13].

Selwyn et al teach a focus ring installed to surround the substrate to be processed, but do not teach that focus ring formed of an insulating material.

Kholodenko et al teach a plasma apparatus (Figure 1) comprising a process chamber 30 with a substrate support 75 and a focus ring that includes a dielectric barrier 92 (insulator) and a conductor element 100 (column 3, line 1 to column 4, line 45). Further, application of DC voltage to the buried element (electrode) to adjust a plasma sheath region above the ring member is a functional limitation and the apparatus of prior art is considered capable of performing this function, since it meets all the structural limitations of the claim.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use a focus ring made from insulating material as taught by Kholodenko et al in the apparatus of Selwyn et al for containing and directing the flow of process gas or plasma to the substrate (Kholodenko et al - column 3, lines 30-45).

Regarding Claims 4, 8: Selwyn et al teach (Figures 12, 13, 13a, 19) that plural buried elements (electrodes) could be used which are installed along a diametrical direction and supplied with independent DC voltages 92a, 92b with the help of controller 96 so as to achieve a stronger control on plasma potential

gradient. Selwyn et al further teach that buried elements (electrodes) could be contained within focus ring also (column 7, line 50 to column 9, line 15).

Claims 2, 3, 6, 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Selwyn et al (US Patent No. 5,716,486) in view of Kholodenko et al (US Patent No. 5,942,039) as applied to Claims 1, 5 and further in view of Hong et al (US Patent No. 5,897,752).

Regarding Claims 2, 6: Selwyn et al in view of Kholodenko et al teach all limitations of the claim including DC power source 39 connected to buried element (electrode) in the focus ring 125. Selwyn et al also teach that primary purpose of focus ring is to alter the plasma adjacent the workpiece, implying that potential on focus ring is altered for altering the plasma near the work piece.

Selwyn et al in view of Kholodenko et al however do not explicitly teach applying first and second DC voltages as per process limitations.

Hong et al teach a plasma processing apparatus (Figures 2, 3) for performing a processing on a to-be-treated substrate 16 mounted on a pedestal (mounting table) 18 in a chamber (processing vessel) 12 by plasma of a processing gas comprising:

- a clamping ring (ring member) 46 formed of ceramic (an insulating material) and installed to surround the to-be-treated substrate 16 on the mounting table 18;

- a metallic film (one or more electrodes) installed in the ring member; and

- a DC power supply 44 for applying a DC voltage to the one or more electrodes (through electrical line 52) to adjust a plasma sheath region above the ring member (column 4, line 55 to column 6, line 45).

Hong et al also teach that DC power supply 44 is variable and with the help of controller 30 enables to apply controlled biasing voltage to the ring member 46 as per process requirements.

Therefore it would have been obvious to apply first and second DC voltages to the electrode embedded inside the focus ring as taught by Hong et al in the apparatus of Selwyn et al in view of Kholodenko et al to enable alter the plasma adjacent the workpiece, as per relevant process limitations.

Regarding Claims 3, 7: Selwyn et al in view of Kholedenko et al and Hong et al teach all structural limitations of the claim (as explained above under claims 1, 2). Claim limitations pertaining to use of apparatus for etching thin films of different thicknesses are intended use limitations and the apparatus of prior art is capable of being used for the same.

In this regards courts have ruled (Case law):

“A claim containing a “recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus” if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).”

“It is well settled that the intended use of a claimed apparatus is not germane to the issue of the patentability of the claimed structure. If the prior art structure is capable of performing the claimed use then it meets the claim. *In re Casey*, 152 USPQ 235, 238 (CCPA 1967); *In re Otto*, 136 USPQ 459 (CCPA 1963).”

“Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danly*, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). Apparatus claims cover what a device is, not what a device does *Hewlett-Packard Co. V. Bausch & Lomb Inc.*, 15USPQ2d 1525, 1528 (Fed. Cir. 1990).”

Claims 10, 13, 16-18, 21, 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Selwyn et al (US Patent No. 5,716,486) in view of Kholodenko et al (US Patent No. 5,942,039) as applied to Claim 5 and further in view of O'Donnell et al (US PGPUB No. 2005/015,0866) and Fakuda et al (US PGPUB No. 2003/0113479).

Regarding Claim 10: Selwyn et al in view of Kholodenko et al teach all limitations of the claim (as explained above under claim 5) except the film formed on the focus ring and sealing of film by resin.

O'Donnell et al teach an apparatus (Figures 4-6) that includes a focus ring 14 and comprising:
aluminum (base material); and

a film (layer 100) formed by thermal spraying of yttria-containing coating (ceramic) [Paragraphs 0041, 0054, 0057, 0059, 0062-0066].

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use focus ring with ceramic coating as taught by O'Donnell et al in the apparatus of Selwyn

et al in view of Kholodenko et al to provide improved wear resistance to physical and /or chemical attack in plasma environment (paragraph 0010).

Selwyn et al in view of Kholodenko et al and O'Donnell et al do not teach at least a portion of thermally sprayed film is sealed by a resin.

Fakuda et al teach a plasma treatment apparatus (Figure 1) that includes internal members 3a, 3b, 7 that are coated with dielectric layers (thermally sprayed ceramic layers) 4a, 4b, 6. Fakuda et al further teach that a sealing treatment is carried out on top of dielectric layer to reduce the void volume of the dielectric coating [Paragraphs 0067- 0080].

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to seal the thermally sprayed film by resin as taught by Fakuda et al in the apparatus of Selwyn et al in view of Kholodenko et al and O'Donnell et al to reduce void volume of barrier coating (paragraph 0080).

Regarding Claims 13, 21: Fakuda et al teach that thermally sprayed ceramic layer is sealed through sol-gel method (Paragraphs 0098, 0099).

Regarding Claim 16: O'Donnell et al teach that main layer is formed of Yttria (Y_2O_3) {Paragraph 0041}.

Regarding Claims 17,18: O'Donnell et al teach (Figures 4-6) that focus ring 14 comprises aluminum (base material), and a film formed on a surface of the base material, wherein the film has a main layer 100 formed by thermal spraying of yttria-containing coating (ceramic) and an intermediate coating (barrier coat layer) 80 formed of Al_2O_3 (ceramic) [Paragraphs 0041, 0059, 0062-0066].

Regarding Claims 23, 24: Selwyn et al in view of Kholodenko et al and O'Donnell et al teach all limitations of the claim including that intermediate coating (barrier coat layer) 80 can be formed of polymers like polyimides and polytetrafluoroethylene (PTFE) {engineering plastics} [O'Donnell et al - paragraph 0065].

Regarding Claim 25: O'Donnell et al teach that main layer 100 is formed of Yttria (Y₂O₃) [0062].

Claims 12, 19, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Selwyn et al (US Patent No. 5,716,486) in view of Kholodenko et al (US Patent No. 5,942,039), O'Donnell et al (US PG PUB No. 2005/015,0866) and Fakuda et al (US PG PUB No. 2003/0113479) as applied to Claims 10, 17 and further in view of George et al (US patent No. 4,357,387).

Regarding Claims 12, 19, 20: Selwyn et al in view of Kholodenko et al, O'Donnell et al and Fakuda et al teach all limitations of the claim including barrier coat layer is thermally sprayed film and also teach sealing of thermally sprayed film using a resin.

Selwyn et al in view of Kholodenko et al, O'Donnell et al and Fakuda et al do not teach resin is selected from the group consisting of SI, PTFE, PI, PAI, PEI, PBI and PFA.

George et al teach sealing of thermally sprayed refractory (includes ceramic) coating using resins to improve surface abrasion and durability of coatings. George et al further teach that sealing resin can be polyimide resin, polyamideimide resin etc (Column 2, lines 55-65 and Column 7, lines 10-50).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to seal the thermally coated film using resin as taught by George et al in the apparatus of Selwyn et al in view of Kholodenko et al, O'Donnell et al and Fakuda et al to improve its surface abrasion and durability.

Claims 15, 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Selwyn et al (US Patent No. 5,716,486) in view of Kholodenko et al (US Patent No. 5,942,039), O'Donnell et al (US PG PUB No. 2005/015,0866) and Fakuda et al (US PG PUB No. 2003/0113479) as applied to Claims 13, 21 and further in view of Panitz et al (US Patent No. 5,925,228).

Regarding Claims 15, 22: Selwyn et al in view of Kholodenko et al, O'Donnell et al and Fakuda et al teach all limitations of the claim except that sealing treatment uses a group 3a element.

Panitz et al teach an apparatus (Figures 1, 2A-2C) where a $\text{Al}_2\text{O}_3 - \text{SiO}_2$ (Al is an element from group 3a) solution is used for sol-gel sealing treatment of porous coatings on metallic substrates to control pore size and density of ceramic coatings on the substrate (Column 3, line 5 to Column 4, line 40).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use group 3a element for sealing of coating as taught by Panitz et al in the apparatus of Selwyn et al in view of Kholodenko et al, O'Donnell et al and Fakuda et al to control pore size and density of ceramic coatings on metal substrates.

Claims 46, 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Selwyn et al (US Patent No. 5,716,486) in view of Kholodenko et al (US Patent No. 5,942,039) as applied to Claims 1, 5 and further in view of Hao et al (US Patent No. 6,363,882).

Regarding Claims 2, 6: Selwyn et al in view of Kholodenko et al teach all limitations of the claim except that top surface of ring is substantially flush with top surface of to-be treated substrate.

Hao et al teach a plasma apparatus (Figure 3) comprising a chuck 154 supported on lower electrode 152 and where an edge ring 156 surrounds and spaced apart from to-be-treated substrate 160. Hao et al further teach that level of top surface of edge ring with respect to substrate top surface may vary according to design of plasma processing system (column 5, line 5 to column 6, line 40).

Therefore it would have been obvious to control (optimize) the level of top surface of ring member as taught by Hao et al in the apparatus of Selwyn et al in view of Kholodenko et al as per specific design of the plasma processing system.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would

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have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 5, 10, 12, 13, 15-25 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 3-5, 7, 9-14, 16-18 of copending Application No. 10/722, 602 in view of Selwyn et al (US Patent No. 5,716,486) and Kholodenko et al (US Patent No. 5,942,039)

Claims 1, 3 of co-pending application teach an internal member (includes ring member) of a plasma processing apparatus comprising a base material; and a film formed by thermal spraying of ceramic on a surface of the base material, wherein the film is formed of ceramic including at least one kind of element selected from the group consisting of B, Mg, Al, Si, Ca, Cr, Y, Zr, Ta, Ce and Nd, and at least a portion of the film is sealed by a resin, wherein the resin is selected from the group consisting of SI, PTFE, PI, PAI, PEI, PBI and PFA;

Claim 4 of co-pending application teaches the ceramic is at least one kind selected from the group consisting of B₄C, MgO, Al₂O₃, SiC, Si₃N₄, SiO₂, CaF₂, Cr₂O₃, Y₂O₃, YF₃, ZrO₂, TaO₂, CeO₂, Ce₂O₃, CeF₃ and Nd₂O₃.

Claim 5 of co-pending application teaches an internal member (includes ring member) of a plasma processing vessel, comprising a base material; and a film formed by thermal spraying of ceramic on a surface of the base material, wherein the film is formed of ceramic including at least one kind of

element selected from the group consisting of B, Mg, Al, Si, Ca, Cr, Y, Zr, Ta, Ce and Nd, and at least a portion of the film is sealed by a sol-gel method;

Claims 7, 9-14 of co-pending application teach the internal member (includes ring member) wherein the sealing treatment is executed by using an element of the Group 3A in the periodic table and;

internal member of the plasma processing vessel comprises a base material, and a film formed on a surface of the base material, wherein the film has a main layer formed by thermal spraying of ceramic and a barrier coat layer formed of ceramic including an element selected from the group consisting of B, Mg, Al, Si, Ca, Cr, Y, Zr, Ta, Ce and Nd, and;

the barrier coat layer is formed of at least one kind of ceramic selected from the group consisting of B.sub.4C, MgO, Al.sub.2O.sub.3, SiC, Si.sub.3N.sub.4, SiO.sub.2, CaF.sub.2, Cr.sub.2O.sub.3, Y.sub.2O.sub.3, YF.sub.3, ZrO.sub.2, TaO.sub.2, CeO.sub.2, Ce.sub.2O.sub.3CeF.sub.3 and Nd.sub.2O.sub.3., and;

wherein the barrier coat layer is a thermally sprayed film at least a portion of which is sealed by a resin, and;

wherein the resin is selected from the group consisting of SI, PTFE, PI, PAI, PEI, PBI and PFA, and;

wherein the barrier coat layer is a thermally sprayed film at least a portion of which is sealed by a sol-gel method, and;

wherein the sealing treatment is executed by using an element of the Group 3a in the periodic table;

Claims 16-18 of co-pending application teach an internal member (includes ring member) of a plasma processing vessel, comprising a base material and a film formed on a surface of the base material, wherein the film has a main layer formed by thermal spraying of ceramic and a barrier coat layer formed of engineering plastic formed between the base material and the main layer, and;

wherein the engineering plastic is selected from the group consisting of PTFE, PI, PAI, PEI, PBI, PFA, PPS and POM, and;

wherein the main layer is formed of at least one kind of ceramic selected from the group consisting of B.sub.4C, MgO, Al.sub.2O.sub.3, SiC, Si.sub.3N.sub.4, SiO.sub.2, CaF.sub.2, Cr.sub.2O.sub.3, Y.sub.2O.sub.3, YF.sub.3, ZrO.sub.2, TaO.sub.2, CeO.sub.2, Ce.sub.2O.sub.3, CeF.sub.3 and Nd.sub.2O.sub.3.

Claims 1, 3-5, 7, 9-14, 16-18 of copending application do not teach substrate mounted on a mounting table in a processing vessel by plasma of a processing gas and a ring member formed of an insulating material and comprising of one or more electrodes to each of which a DC voltage is applied to adjust a plasma sheath region above the ring member.

Selwyn et al teach a plasma processing apparatus (Figure 19) for performing a processing on a to-be-treated substrate 22 mounted on a electrode assembly 20 (mounting table) in a chamber (processing vessel) by plasma of a processing gas comprising:

a focus ring 125 installed to surround the to-be-treated substrate 22 on the electrode assembly 20 and spaced apart from an outer periphery of the substrate 22;

a buried element (one or more electrodes) embedded in the focus ring member 125; and,

a DC power supply 39 for applying a DC voltage to the one or more buried elements (electrode) [column 8, line 66 to column 9, line 13].

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use a plasma apparatus with a focus ring surrounding and spaced from the workpiece and applied with DC voltage as taught by Selwyn et al in the apparatus of claims 1, 3-5, 7, 9-14, 16-18 of copending application to control and confine plasma adjacent the workpiece.

Claims 1, 3-5, 7, 9-14, 16-18 of copending application in view of Selwyn et al teach a focus ring installed to surround the substrate to be processed, but do not teach that focus ring is formed of an insulating material.

Kholodenko et al teach a plasma apparatus (Figure 1) comprising a process chamber 30 with a substrate support 75 and a focus ring that includes a dielectric barrier 92 (insulator) and a conductor element 100 (column 3, line 1 to column 4, line 45). Further, application of DC voltage to the buried element (electrode) to adjust a plasma sheath region above the ring member is a functional limitation and the apparatus of prior art is considered capable of performing this function, since it meets all the structural limitations of the claim.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use a focus ring made from insulating material as taught by Kholodenko et al in the apparatus of Claims 1, 3-5, 7, 9-14, 16-18 of copending application in view of Selwyn et al for containing and directing the flow of process gas or plasma to the substrate 25 (Kholodenko et al - column 3, lines 30-45).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rakesh K. Dhingra whose telephone number is (571)-272-5959. The examiner can normally be reached on 8:30 -6:00 (Monday - Friday).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571)-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Rakesh Dhingra



Parviz Hassanzadeh
Supervisory Patent Examiner
Art Unit 1763